



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,709	11/28/2001	Ju Ming Liang	LIAN3010/EM	7911

7590

08/25/2003

Eugene Mar
BACON & THOMAS, PLLC
Fourth Floor
625 Slaters Lane
Alexandria, VA 22314-1176

EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
----------	--------------

1756

DATE MAILED: 08/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/994,709

Applicant(s)

LIANG ET AL.

Examiner

Martin J Angebranndt

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1756

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 3, both the upper and lower dielectric layers are between the reflective layer and the recording layer. In the specification, the lower dielectric layer is between the recording layer and the substrate. (spec at 3/10-11). The upper layer dielectric layer is made up of a first upper dielectric layer and a second dielectric layer (3/11-12). It is not clear if the claims intends only the upper dielectric layer to be between the reflective and recording layer or intends to indicate that two dielectric layers are present between the reflective layer and the recording layer.

The examiner notes that when the first and second upper dielectric layers are the same material and of the same composition, it is improper to refer to them as two layers. (4/20-22). As the applicant has opened the specification up to this in the cited language, the examiner considers any upper layers in the prior art to be composites, until any claims reciting the first and second upper dielectric layers indicate that they differ in composition explicitly or implicitly by indicating that they differ in a physical property such as thermal conductivity **(using language from the specification)**.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 1756

4. Claims 3-5 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the two upper dielectric layers between the recording layer and the reflective layer, does not reasonably provide enablement for the lower dielectric layer to be one of these dielectric layers. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

The applicant should amend the claims to correctly indicate the position of the lower dielectric layer and if desired, the presence of a first and second dielectric layer between the recording layer and the reflective layer.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1,3,5-9 are rejected under 35 U.S.C. 102(e) as being fully anticipated by

Nakamura et al. '958.

Art Unit: 1756

Nakamura et al. '958 teaches a polycarbonate substrate, sequentially sputtered with 80 nm ZnS-SiO₂ dielectric layer, a 18 nm AgInSbTeN recording film, a 32 nm ZnS-SiO₂ dielectric layer a 160 nm AlTi reflective layer and a 10 micron UV cured protective layer. (10/18-30 for structure and table 2 for compositions, 12/40-48). Examples using recording layers having the composition $\text{Ag}_{1.7}\text{In}_{6.6}\text{Sb}_{66.3}\text{Te}_{23.4}\text{N}_{2.0}$, $\text{Ag}_{1.5}\text{In}_{6.4}\text{Sb}_{65.2}\text{Te}_{22.9}\text{N}_{4.0}$, or $\text{Ag}_{1.4}\text{In}_{6.3}\text{Sb}_{64.7}\text{Te}_{22.6}\text{N}_{5.0}$ meet the claims. The use of silver, silver alloys with gold or copper and aluminum alloyed with copper appear in table 3 in column 13. Ag alloys with Au and Cu are taught to be especially preferred and have a better repetition of O/W times than AlTi. Silver is disclosed as having the best reflectivity (13/24-31). The thickness of the reflective layer may be up to 200 nm (4/37-38)

The examiner notes that when the first and second upper dielectric layers are the same material and of the same composition, it is improper to refer to them as two layers. (4/20-22). As the applicant has opened the specification up to this in the cited language, the examiner considers any upper layers in the prior art to be composites, until any claims reciting the first and second upper dielectric layers indicate that they differ in composition explicitly or implicitly by indicating that they differ in a physical property such as thermal conductivity (**using language from the specification**).

8. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. '958.

It would have been obvious to one skilled in the art to modify the invention of the examples cited by replacing the AlTi reflective layer with either Ag, AgCu and AgAu to gain improvements in reflectance or the number of overwrite/writer cycles the medium can go through.

Art Unit: 1756

9. Claims 1-9 are rejected under 35 U.S.C. 102(e) as being fully anticipated by Tominaga et al. JP 10-166738.

Tominaga et al. JP 10-166738 (machine translation attached) teaches a polycarbonate substrate, sequentially sputtered with 200 nm ZnS-SiO₂ dielectric layer (85% ZnS), a 50 nm Ag_{6.19}In_{4.44}Sb_{60.42}Te_{27.98}V_{0.96} recording film, a 20 nm ZnS-SiO₂ dielectric layer (85% ZnS) a 150 nm Au reflective layer and a 5 micron UV cured protective layer. [0077-0080]. A similar medium using the recording layer of example 2, which is Ag_{7.48}In_{5.52}Sb_{61.71}Te_{23.29}V_{2.00} [0081]. The use of various additives to the AgInSbTe recording layers are disclosed including V, Si, C, W, Ta or Ti in amounts of up to 5% [0011]. The use of Au, Ag, Pt and Cu and alloys thereof in thicknesses of up to 200 nm is disclosed [0055].

10. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuzuhara et al. JP 11-070738.

Yuzuhara et al. JP 11-070738 (machine translation attached) teaches a polycarbonate substrate, sequentially sputtered with 170 nm ZnS-SiO₂ dielectric layer, a 18 nm AgInSbTe recording film, a 20 nm ZnS-SiO₂ dielectric layer and a 100 nm AlTi reflective layer. [0019]. Table 3 shows examples 39-45 which are embraced by the claims using Zr as the additive. The use of reflective layers of Au, Ag, Cu, Al, ... with thicknesses of 30-250 nm is disclosed. [0016].

It would have been obvious to one skilled in the art to modify the invention of the examples cited by replacing the 100 nm AlTi reflective layer with a thicker layer, such as 150 nm with a reasonable expectation of achieving comparable results and to replace the AlTi reflective layer with either Ag, Al, Cu, Au or alloys thereof based upon the disclosure of equivalence.

Art Unit: 1756

11. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. EP 1058249.

Yamada et al. EP 1058249 teaches a polycarbonate substrate, sequentially sputtered with a ZnS-SiO₂ dielectric layer, a AgInSbTe recording film, a ZnS-SiO₂ dielectric layer and an Al reflective layer and a UV cured resin protective layer. [0085] Table 1 shows examples 7 and 8 which are embraced by the claims using N or C as the additive. The use of reflective layers of Au, Ag, Cu, Al, ... with thicknesses of 70-200 nm is disclosed. [0071]. The use of B,C,N, Si, or other group 5B elements, like P in small amounts.

It would have been obvious to one skilled in the art to modify the invention of the examples cited by using a 160-200 nm thick Al reflective layer with a reasonable expectation of achieving comparable results based upon the disclosure. Further it would have been obvious to use other elements disclosed as additives in the same amounts as N or C, in their place based upon the disclosure of equivalence.

12. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **either** Yamada et al. EP 1058249, Yuzuhara et al. JP 11-070738, Tominaga et al. JP 10-166738 **or** Nakamura et al. '958, in view of Uno et al. '690.

Uno et al. '690 teaches barrier layer placed between protective layers, such as ZnS-SiO₂ protective layers and phase change recording layers to prevent migration of elements into or out of the recording layer which has a deletrious effect on the medium. The use of barrier layers having good adhesion properties is also disclosed. The use of oxides or nitrides of Si or Al is disclosed. (6/41-57).

Art Unit: 1756

It would have been obvious to modify the inventions of **either** Yamada et al. EP 1058249, Yuzuhara et al. JP 11-070738, Tominaga et al. JP 10-166738 **or** Nakamura et al. '958 by adding an additional layer between the recording layer and the dielectric layer, such as oxides or nitrides of Si or Al, to prevent unwanted diffusion between the dielectric layers and the recording layer.

13. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **either** Yamada et al. EP 1058249, Yuzuhara et al. JP 11-070738, Tominaga et al. JP 10-166738 **or** Nakamura et al. '958, in view of Yoshinari et al. '399 or Kawahara et al. 669.

Yoshinari et al. '399 teach the use of a bilayer dielectric on both sides of the recording layer, where the dielectric layer closer to the reflective layer (2b) has a lower thermal conductivity than the one closer to the recording layer (2a). (12/47-67). The bilayer design is disclosed as allowing for better control over heat dissipation and prevention of peeling (6/32-43 and 1/43-2/50).

Kawahara et al. 669 teach the provision of a second or fifth dielectric layer having a higher thermal conductivity than dielectric layers on either side (first and third or fourth and sixth respectively) (3/13-50). This is disclosed as controlling the thermal characteristics to increase the power margin and stability (2/42-49).

It would have been obvious to modify the inventions of **either** Yamada et al. EP 1058249, Yuzuhara et al. JP 11-070738, Tominaga et al. JP 10-166738 **or** Nakamura et al. '958 by adding an additional dielectric layers between the recording layer and the reflective layer or the substrate which have higher thermal conductivity to optimize the thermal properties of the

Art Unit: 1756

recording media and prevent peeling using layers such as those as taught by Yoshinari et al. '399 or Kawahara et al. 669.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

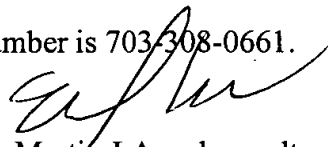
JP 11-250499 teaches AgInSbTeV recording layers in table 1, Yamada et al. '828 teaches AgInSbTeN, and JP 08-216522 teaches AgInSbTeN recording layers in table 2 and these are considered cumulative.

Shinozuka et al. JP 05-185732 and Yuzuhara et al. 2000-218938 teach AgInSbTe based recording media with various additives

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebranndt
Primary Examiner
Art Unit 1756

August 18, 2003